

1

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MOVABLE ROOF DEVICE

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This invention relates to a movable and remotely controllable roof section for houses and other types of buildings.

Modern architectural designs for homes and the like often provide for open court-like areas within the perimeter of the housing that are exposed to the sun and open air. Heretofore, such areas were not fully practical because during adverse weather conditions they were exposed and unprotected from temperature extremes and from the wind and rain. One primary object of the present invention is to overcome the aforesaid problem by providing a movable roof section for covering internal courts or atriums in houses that can be moved mechanically by operation of a single remotely located switch control to either the open or closed position as desired.

Another object of my invention is to provide mechanically controllable roof sections for houses and the like that can be moved back and forth to expose and close an opening in the roof of the house and which can be installed on either flat or sloped roofs.

Another object of the present invention is to provide a movable roof closure for houses that will seal the roof opening above an atrium or the like and prevent the influx of rain and wind when in the closed position.

More specifically, an object of the invention is to provide a movable closure assembly for roof openings in housings and the like wherein the closure assembly has its own electrical drive system and wheels, and is adapted to ride in parallel tracks supported by the roof on opposite sides of the opening.

Still another object of my invention is to provide a remotely controllable movable roof section for covering and uncovering a roof opening that is driven by electrical power and wherein a conduit supplying current to a motor carried by the roof so as not to obstruct the movement of the roof section back and forth with respect to the roof opening.

Another object of the invention is to provide a remotely controllable movable roof closure for houses that is particularly well adapted for ease and economy of manufacture, as well as being easy to install and maintain with a minimum of labor and without the necessity for special tools.

A further object of the invention is to provide a mechanically controllable roof closure device for atriums and the like in houses that can be moved to any desired intermediate position, as well as to the open and closed positions. My invention provides for an instantaneous and positive acting control which enables the roof section to be moved to any desired position and which overcomes any rollback problems on sloped roofs and also any overrun problems due to the momentum of the closure structure.

Other objects, advantages and features of my invention will become apparent from the following detailed description and the accompanying drawings, in which:

FIG. 1 is an enlarged fragmentary view in perspective showing a movable roof for a house or building embodying the principles of the invention;

FIG. 2 is an enlarged fragmentary view in elevation showing details of the drive system for the movable roof of FIG. 1;

FIG. 3 is a fragmentary plan view of the drive system shown in FIG. 2;

2

FIG. 4 is a fragmentary view in elevation and in section taken along line 4-4 of FIG. 3;

FIG. 5 is a view in elevation showing an embodiment of my movable roof section for installation on sloped roofs;

FIG. 6 is a fragmentary plan view showing an alternative form of drive system for a movable roof section according to the invention;

FIG. 7 is a wiring diagram of the electrical drive system for the movable roof sections of FIGS. 1-6.

Referring to the drawings, FIGS. 1-3 show a movable skylight, atrium cover, or roof section 10 embodying the principles of the invention. Although our movable roof section 10 may be installed on various types of houses or buildings and on flat or pitched roofs, it is particularly adaptable for use as a removable cover for a court or patio area located within the perimeter of the house. In accordance with the invention, the roof section is remotely controllable so that it can be rolled back from the roof opening to expose the room or court below directly to the open air. As shown in a typical installation in FIG. 1, the house roof 11 is provided with a rectangular opening 12 having an inner casement or frame 13 that extends somewhat above the roof level. Fixed to the roof 11 and extending along opposite sides and beyond one end of the opening 12 are a pair of support members 14, such as wooden 4 x 4's to each of which is fixed a channel member 15 that is open upwardly. The support members 14 maintain the channel members 15 well above any gravel or other material which may be used on the roof surface. These channel members 15, extending parallel on opposite sides of the opening 12 serve as guide rails in which the movable roof section 10 is supported as it moves backward and forward.

The movable roof section 10 of FIG. 1 comprises generally a rectangular frame 16 consisting of a pair of rigid end members 17 and 18 and a pair of side members 19 and 20 which may be of wood or metal material and all of which are connected together in a suitable manner at their ends to provide adequate strength. Attached to the end frame member 17 is a pair of brackets 21 each supporting a rotatable wheel 22, the wheels being spaced at the same distance apart as the channel members or guide rails 15.

Fixed along the side frame members 19 and 20 and extending downwardly therefrom so as to overlap the outside vertical surfaces of the supports 14, as shown in FIG. 4, are a pair of skirt members 23 made from flexible heat and moisture resistant sheet plastic or rubber-like material. The latter member 23 serve as an effective seal to prevent wind or rain from entering the roof opening 12 around the sides of the roof section 10 when it is in the closed position.

Any suitable rigid material, either transparent or opaque, may be used to cover the frame 16. For example, glass or a suitable plastic could be utilized, and it can be supported in any desired manner on the frame 16, preferably using a series of cross supporting members 24.

To the end member 18 at the opposite end of the frame 16 are attached another pair of bracket members 25 for supporting a pair of wheels 26 at the same spaced apart distance as the wheels 22 and the guide rails 15. All four of the wheels 22 and 26 preferably have a rubber tire portion with a tread width which causes them to fit snugly and thus to run smoothly in the guide rails 15. As shown best in FIG. 3, each of the bracket members 25 is provided with a bearing 27 for supporting opposite ends of an axle member 28 to which the latter wheels 26 are attached. Spaced inwardly from one bracket member 25 is a mounting plate 29 which is fixed to the end frame